

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: TANAKA et al

Serial No.: 08/838,910

Filed: April 11, 1997

Title: OXYGEN CONCENTRATION DETECTOR



Examiner: T. Tung

Art Unit: 1743

TECHNICAL ROOM

CT-1 100

PROCESSED

N. Lawrence
#34
10-8-99

* * * * *

October 4, 1999

[October 2, 1999 = Saturday]

REPLY BRIEF

Honorable Commissioner of
Patents & Trademarks
Washington, D. C. 20231

Sir:

In response to the Examiner's Answer of August 2, 1999, Applicants submit herewith this Reply Brief under 37 C.F.R. § 1.193(b)(1), in triplicate as required by 37 C.F.R. § 1.192.

Claims 12-15 and 27-31 are allowed.

Claims 21-26 and 32-37 stand rejected.

The Examiner has withdrawn the rejection under 35 U.S.C. § 112, first paragraph.

Applicants' position concerning the rejection of claims 32-35 and 37 35 under U.S.C. § 103(a) over U.S. Patent No. 4,900,412 to Ker et al. in view of U.S. Patent No. 4,935,118 to Agarwal et al. are set forth in the Appeal Brief and incorporated by reference herein.

Applicants add the following remarks concerning the rejection of claims 21-26 and 36 under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 4,540,479 to Sakurai et al. in view of U.S. Patent No. 4,452,687 to Torisu et al. and U.S. Patent No. 4,021,326 to Pollner et

al., and optionally U.S. Patent No. 4,212,720 to Maurer et al. or U.S. Patent No. 4,900,412 to Ker et al.

As set forth in independent claims 21 and 36, the oxygen concentration detector comprises a high-emissivity layer having an emissivity of 0.3 or more and a porosity more than 10 percent. This high-emissivity layer is provided on a surface of an internal electrode for the purpose of absorbing heat radiated from an adjacent heater and efficiently transferring the heat to a solid electrolyte. As a consequence, the rate at which the electrodes are heated is accelerated by the high-emissivity layer.

The Examiner is unable to point to any teaching in the art of record of the claimed high-emissivity layer (having the characteristics set forth in claims 21 and 26) placed on a surface of the internal electrode. Instead, in an attempt to show that this feature is obvious the Examiner relies on Pollner, which allegedly discloses an external electrode protective layer having a porosity of 1-50%, even though Pollner does not reasonably suggest that this external electrode protective layer would be acceptable for protecting the internal electrode. In support of his position, the Examiner hypothesizes as follows:

It would also have been obvious for Torisu to adopt the porosity value of Pollner for its layer over the inner electrode. This is so, because, while this layer protects the inner electrode, it must also at the same time be sufficiently porous to permit the passage of the reference air. A porosity value of more than 10% would obviously accomplish both purposes.

The absence of any teaching in Pollner that its external electrode protective layer may be used to protect an internal electrode is not surprising, since protective layers for protecting internal electrodes serve different functions than those for protecting external electrodes. External electrode protective layers, such as the one disclosed in Pollner, are generally used for preventing liquid-like impurities contained in exhaust gas from adhering on the external

electrode. By contrast, protective layers placed on internal electrodes are designed to prevent sensor output from being decreased by silicon gas (generated from silicon components), which adheres to and poisons the internal electrode. It is understood by those of ordinary skill in the art that such poison-preventing layers require a fine porosity to effectively block the silicon gas from reaching the internal electrode. Thus, to the extent that one of ordinary skill in the art would have taken porosity into consideration, said skilled artisan would have understood the internal electrode protective layer would need a porosity smaller than 10% to function effectively.

Applicants point out that despite the Examiner's finding that this argument is "not persuasive", the Examiner states at page 7 of the Examiner's Answer as follows:

[O]ne of ordinary skill in the art would recognize [*sic*] that the inner electrode and the outer electrode face different environments and thus design their protective layers accordingly.

Applicants agree. Indeed, this is the same premise on which Applicants have rested their arguments of patentability, and the same premise that the Examiner has found as "not persuasive," throughout prosecution. One of ordinary skill in the art would have recognized that the inner and outer electrodes face different environments and, thus, involve different design criteria. Given this understanding, one of ordinary skill in the art would not have looked to the design of outer electrode protective layers for guidance in making the inner electrode protective layer. Moreover, even accepting, *arguendo*, that Pollner discloses porosity and thickness as design criteria for outer layer protective layers, there is not teaching in the art that reasonably suggests that porosity and thickness should be considered as crucial design criteria for the inner layer protective layer, or that porosity and thickness could be controlled to attain the unexpected behavior of the claimed invention.

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For these reasons, it is respectfully submitted that the Section 103(a) rejection of claims 21-26 and 36 is misplaced. Therefore, reversal of the rejection is respectfully requested.

For all the above-discussed reasons, reversal of the rejections under Section 103(a) and allowance of claims 21-26 and 32-37 are respectfully requested.

Respectfully submitted,

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

R : Appeal to the Board of Patent Appeals and Interferences

GP 1743 PATENT APPLICATION

In re PATENT APPLICATION of

Inventor(s): TANAKA et al.

Appl. No.: 08

Series Code ↑

838,910

Serial No. ↑

Group Art Unit: 1743

Examiner.: T. Tung

Atty. Dkt. PM 235648

M#

41897-USC-JSJ

Client Ref

Filed: April 11, 1997

Title: OXYGEN CONCENTRATION DETECTOR

Date: October 4, 1999 [Oct. 2 = Saturday]

Asst. Commissioner of Patents

and Trademarks

Washington, D.C. 20231

Sir:

1. ☐ **NOTICE OF APPEAL:** Applicant hereby appeals to the Board of Patent Appeals and Interferences from the decision (not Advisory Action) dated _____ of the Examiner twice/finally rejecting claim(s) in this application or in this application and its parent application.
2. ☐ **BRIEF** on appeal in this application attached in triplicate.
3. ☒ An **ORAL HEARING** is respectfully requested under Rule 194 (due two months after Examiner's Answer- unextendable)
4. ☒ Reply Brief is attached in triplicate (due two months after Examiner's Answer - unextendable).
5. ☐ "Small entity" verified statement filed: ☐ herewith. ☐ previously.

6. FEE CALCULATION

	Large/Small Entity		Fee Code
If box 1 above is X'd, see box 12 below first and decide: enter	\$300/150*	\$0	119/219
If box 2 above is X'd, see box 12 below first and decide: enter	\$300/150*	\$0	120/220
If box 3 above is X'd, see box 12 below first and decide: enter	\$260/130*	\$260	121/221
If box 4 above is X'd, enter nothing	- 0 - (no fee)		
7. Original due date: October 2, 1999 = Saturday			
8. Petition is hereby made to extend the original due date to cover the date this response is filed for which the requisite fee is attached.	(1 mo)	\$110/\$55	115/215
	(2 mos)	\$380/\$190	116/216
	(3 mos)	\$870/\$435	117/217
	(4 mos)	\$1360/\$680	118/218
9. Enter any previous extension fee paid <input type="checkbox"/> previously since above original due date (item 7); <input type="checkbox"/> with concurrently filed amendment		+0	
10. Subtract line 9 from line 8 and enter: Total Extension Fee		+0	
11. TOTAL FEE ATTACHED =		\$260	

12. ☐ *Fee NOT required if/since paid in prior appeal in which the Board of Patent Appeals and Interferences did not render a decision on the merits.

(Our Deposit Account No. 03-3975)

(Our Order No. 30954 235648)

C#

M#

CHARGE STATEMENT: The Commissioner is hereby authorized to charge any fee specifically authorized hereafter, or any missing or insufficient fee(s) filed, or asserted to be filed, or which should have been filed herewith or concerning any paper filed hereafter, and which may be required under Rules 16-18 (missing or insufficiencies only) now or hereafter relative to this application and the resulting Official Document under Rule 20, or credit any overpayment, to our Accounting/Order Nos. shown above, for which purpose a duplicate copy of this sheet is attached.

This CHARGE STATEMENT does not authorize charge of the issue fee until/unless an issue fee transmittal sheet is filed.

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NOTE: Fil this cover sheet in duplicate with PTO receipt (PAT-103A) and attachments